AMENDMENTS TO THE CLAIMS:

This listing of claims will replace all prior versions, and listings, of claims in the application:

Claims 1-25 – cancelled.

26. (Currently Amended) A tunable optical device comprising a semiconductor laser diode and a feedback section for providing wavelength selective feedback to the laser diode wherein the feedback section comprises:

i) a zone plate device for delivering optical radiation at a predetermined location for use in said feedback, the zone plate device providing a non-rectilinear diffraction grating which diffracts incident radiation onto an optical axis through the device; and

ii) control means for controlling optical performance of the zone plate device,

wherein said control means comprises means to change the refractive index of material of the zone plate device so as to control the wavelength of the optical radiation delivered at said predetermined location.

27. (Previously Amended) A tunable optical device as in claim 26 wherein the control means comprises means to apply an electric field to said material of the zone plate device.

28. (Previously Amended) A tunable optical device as in claim 27 wherein the material of the zone plate device is electro-optic.

29. (Previously Amended) A tunable optical device as in claim 28 wherein the material of the zone plate device comprises strontium barium niobate.

30. (Previously Amended) A tunable optical device as in claim 29 wherein the material of the zone plate device comprises SBN:75.

31. (Previously Amended) A tunable optical device as in claim 26 wherein the zone plate device comprises a piece of said material, the piece of material having zone plate elements on a first facet thereof and said predetermined location coinciding with a second facet thereof.

32. (Previously Amended) A tunable optical device as in claim 31 wherein the dimension of the zone plate device from the first facet to the second facet is at least 200 microns.

33. (Previously Amended) A tunable optical device as in claim 31, wherein the control means comprises electrodes extending from the first facet to the second facet for creating an electric field in the piece of material.

34. (Previously Amended) A tunable optical device as in claim 26 wherein the zone plate device provides amplitude zone plate elements.

35. (Previously Amended) A tunable optical device as in claim 26 wherein the zone plate device provides phase zone plate elements.

36. (Previously Amended) A method of tuning an optical device, which optical device comprises a last diode optically coupled to a zone plate device for providing wavelength selective optical feedback to the laser diode, wherein the method comprises the step of applying an electric field to material of the zone plate device so as to change its optical performance.

37. (Previously Amended) A method of tuning an optical device as in claim 36 wherein the step of applying an electric field to material of the zone plate device changes its optical performance so as to change the wavelength at which the zone plate device forms an image in a predetermined image plane.

38. (Currently Amended) A method of tuning an optical device, which optical device comprises a zone plate device for frequency filtering of optical radiation so as to deliver radiation of a selected frequency at a predetermined location along an optical axis through the device, wherein the method comprises the step of applying an electric field to material of the zone plate device so as to change its optical performance whereby the frequency selected for delivery at the predetermined location is ~~changed~~controlled.

Claims 39-42 – cancelled.

43. (Currently Amended) A tunable optical device as in claim ~~42~~26 wherein the zone plate device provides at least part of an external cavity in relation to the laser diode..

44. (Previously Presented) A tunable optical device as in claim 43 wherein the external cavity is entirely provided in material other than air.

45. (Currently Amended) A tunable optical device as in claim 43 wherein the zone plate device comprises a piece of material, optically transparent over a range of wavelengths, which, in use, is optically coupled to a facet of the laser diode and transmits optical radiation from the diode to the non-rectilinear diffraction grating, said piece of material providing the material whose refractive index is changed by the control means so as to control the wavelength of the optical radiation delivered at said predetermined location.

46. (Previously Presented) A tunable optical device as in claim 45 wherein the non-rectilinear diffraction grating is constructed as variations in refractive index in material of the zone plate device.

47. (Previously Presented) A tunable optical device as in claim 45 wherein the non-rectilinear diffraction grating is arranged to image incident radiation, the radiation having a selected wavelength, onto a predetermined image plane.

48. (Previously Presented) A tunable optical device as in claim 47 wherein the incident radiation is received from an object plane and the object and image planes are coincident.

49. (Previously Presented) A tunable optical device as in claim 47 wherein the zone plate device is arranged in fixed relation to the image plane.

50. (Previously Presented) A tunable optical device as in claim 47 wherein the image plane is coincident with a surface of the zone plate device.

51. (Previously Presented) A tunable optical device as in claim 45 wherein the non-rectilinear diffraction grating is rotationally symmetric.

52. (Currently Amended) A tunable optical device as in claim ~~42~~26, further comprising a mode hop control device.

53. (Previously Presented) A tunable optical device as in claim 52 wherein the mode hop control device comprises a waveguide together with control means for controlling its optical performance.

54. (Previously Presented) A tunable optical device as in claim 53 wherein the control means comprises electrodes for applying an electric field to material of the waveguide.

55. (Previously Presented) A tunable optical device as in claim 54 wherein the waveguide is constructed at least in part in electro-optic material and wherein the electrodes are arranged to apply an electric field to the electro-optic material.

56. (Previously Presented) A tunable optical device as in claim 53 wherein the waveguide is adapted to increase a received spot size of optical radiation for delivery to the zone plate device.

57. (Previously Presented) A tunable optical device as in claim 56 wherein the waveguide is adiabatically tapered.

58. (Previously Presented) A tunable optical device as in claim 45 wherein the zone plate device is optically coupled directly to a facet of the laser diode.

59. (Previously Presented) A tunable optical device as in claim 52 wherein the zone plate device is optically coupled to a facet of the laser diode via the mode hop control device.

60. (Previously Presented) A tunable optical device as in claim 52 wherein the zone plate device and the mode hop control device are constructed at least in part from a common piece of material.

61. (New) A tunable optical device as in claim 43 wherein the external cavity comprises a waveguide.

62. (New) A tunable optical device comprising:

i) a zone plate device for delivering optical radiation at a predetermined location along an optical axis through the device, the zone plate device providing a non-rectilinear diffraction grating which diffracts incident radiation onto said optical axis; and

ii) control means for controlling optical performance of the zone plate device, wherein said control means, comprises means to change the refractive index of material of the zone plate device so as to switch the optical intensity of the optical radiation delivered at said predetermined location between high and low levels.

63. (New) A tunable optical device as in claim 62 wherein the control means comprises electrodes extending from the first facet to the second facet for creating an electric field in the material.